Name: Date:

Polynomial Factoring solution (version 5)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 4x + 15 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(4) \pm \sqrt{(4)^2 - 4(1)(15)}}{2(1)}$$

$$x = \frac{-(4) \pm \sqrt{16 - 60}}{2(1)}$$

$$x = \frac{-4 \pm \sqrt{-44}}{2}$$

$$x = \frac{-4 \pm \sqrt{-4 \cdot 11}}{2}$$

$$x = \frac{-4 \pm 2\sqrt{11}\, i}{2}$$

$$x = -2 \pm \sqrt{11}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $3 + 6i$ and $-4 + 2i$ in standard form $(a + bi)$.**

Solution

$$(3 + 6i) \cdot (-4 + 2i)$$

$$-12 + 6i - 24i + 12i^2$$

$$-12 + 6i - 24i - 12$$

$$-12 - 12 + 6i - 24i$$

$$-24 - 18i$$

Polynomial Factoring solution (version 5)

3. **Write function $f(x) = x^3 - 7x^2 + 2x + 40$ in factored form. I'll give you a hint: one factor is $(x + 2)$.**

Solution

	1	-7	2	40
-2		-2	18	-40
	1	-9	20	0

$$f(x) = (x + 2)(x^2 - 9x + 20)$$

$$f(x) = (x + 2)(x - 4)(x - 5)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x + 8) \cdot (x + 3)^2 \cdot (x - 2)^2$$

Sketch a graph of polynomial $y = p(x)$.